

REMARKS

This paper is responsive to any paper(s) indicated above, and is responsive in any other manner indicated below.

PENDING CLAIMS

Claims 1-14, 57-74 and 77-80 were pending, under consideration and subjected to examination in the Office Action. At entry of this paper, Claims 1-14, 57-74 and 77-80 remain pending for further consideration and examination in the application.

ALLOWED CLAIM(S)

Claims 1-14 have been allowed in the application, as indicated within the "Allowable Subject Matter" section on page 3 of the Office Action. Applicant and the undersigned respectfully thank the Examiner for such indication of allowable subject matter.

CLAIMS 57-62 AND 77-80 - RECAPTURE REJECTION - TRAVERSED

The **recapture rejection** of claims 57-62 and 77-80 is respectfully traversed. More particularly, such claims **include the disputed recapture limitations, e.g., where "said semiconductor chip is fixed to a part of each of said suspension**

leads by adhesive". That is, independent claim 57 was previously amended to **include the disputed recapture limitations**, and the present Office Action provides ABSOLUTELY NO GUIDANCE as to which subject matter has been omitted from claim 57 (and claims 58-62 and 77-80 by dependency) so as to constitute recapture. In view of the above, Applicant and the Undersigned respectfully request the Examiner to **provide further guidance as to the subject matter which has been omitted from claim 57 so as to constitute (i.e., support) recapture, or else the recapture rejection of claims 57-62 and 77-80 should be withdrawn and the claims indicated as being allowable.**

CLAIMS 63-74 - RECAPTURE REJECTION - TRAVERSED

Regarding remaining **claims 63-74**, the following is submitted in rebuttal of any remaining recapture concerns. That is, Applicant continues to traverse the recapture rejections.

It is respectfully submitted that no specific rebuttal of any of Applicant's 16 November 1999 arguments is given within the present Office Action. That is, the present Office Action comments, in essence, merely state that "Applicant's arguments regarding recapture are not agreed with, and the rejection maintained".

In accordance with the USPTO Policy as stated in MPEP §707.07(f), "where the requirements are traversed, or suspension thereof requested, the examiner should make proper reference thereto in his or her action on the amendment. Where the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it." More particularly, MPEP §707.07(f) states in relevant *verbatim*, "The importance of

answering applicant's arguments is illustrated by *In re Herrmann*, 261 F.2d 598, 120 USPQ 182 (CCPA 1958) where the applicant urged that the subject matter claimed produced new and useful results. The court noted that since applicant's statement of advantages was not questioned by the examiner or the Board of Appeals, it was constrained to accept the statement at face value and therefore found certain claims to be allowable. See also *In re Soni*, 54 F.3d 746, 751, 34 USPQ2d 1684, 1688 (Fed. Cir. 1995) (Office failed to rebut applicant's argument).” Since the Examiner has failed to respond to Applicant's arguments and statements traversing the recapture rejection of the claims, it is respectfully noted that such may be taken that the Examiner has acquiesced to Applicant's arguments and statements. As an example, Applicant's prior arguments rebutted all of the legal cases cited within the Office Action in support of the recapture rejections, i.e., Applicant showed all cases to be irrelevant to the factual situation at hand.

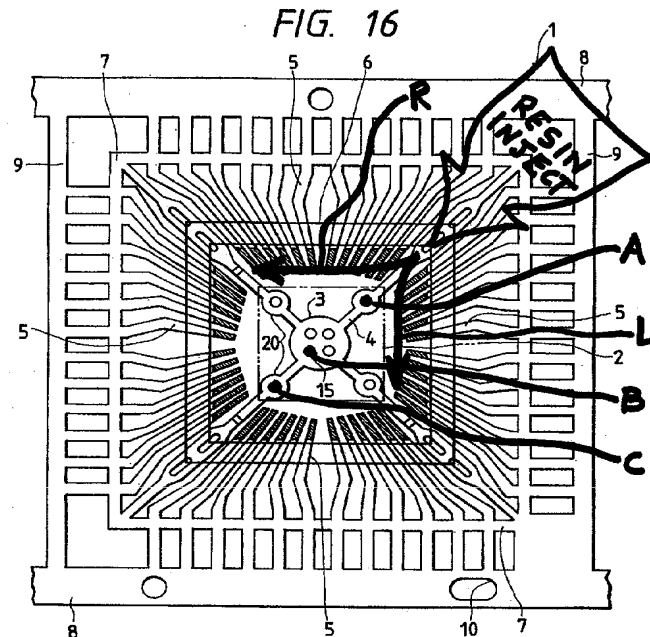
As additional traversal arguments beyond previous arguments, Applicant respectfully submits the following. More particularly, even if one were to assume that Applicant's claims 63-74 were recapturing some subject matter, it is respectfully noted that **attempting to recapture a portion of previously surrendered scope is permissible if the reissue “materially narrows” the claims relative to the originally filed claims in a way that relates to the subject matter surrendered.** According to the court, **a narrowed limitation may be “modified . . . so long as it continues to materially narrow the claim scope relative to the surrendered subject matter such that the surrendered subject matter is not entirely or substantially recaptured.”**

It is respectfully submitted that the present claims 63-74 “**materially narrow the claim scope relative to the surrendered subject matter such that the surrendered subject matter is not entirely or substantially recaptured**”, as follows.

Regarding **claims 73 and 74**, in reviewing the independent claims during reissue review for the present application, it has been determined that the patented claim limitations of (e.g., see claim 1) “said semiconductor chip is fixed to a part of each of said suspension leads by adhesive which is located under a peripheral portion of said semiconductor chip”, are **unnecessarily restrictive in scope, and thus are an “error”**.

More particularly, during prosecution of the parent patent, it was argued that the advantage of the foregoing was that “adhesion of the semiconductor chip to the leadframe can be sufficiently provided so as to prevent a shifting of the semiconductor chip during manufacturing.” However, it has subsequently been realized (since original prosecution) that it is **NOT absolutely necessary** to fix (e.g., adhere) a semiconductor chip to **each suspension lead (i.e., all suspension leads)** in order to prevent shifting.

More particularly, all that may be required is that the semiconductor chip be minimally fixed at **two shift-preventing positions separated from each other** to prevent shifting during manufacturing (e.g., resin encapsulation). A modified version of Applicant’s FIG. 16 will be used in example explanation as follows:



Applicant's FIG. 16 (w/explanatory marked modifications)

More particularly, as one example, assume that resin is injected (during a resin encapsulation operation) from a FIG. 16 die corner opposing a point A, in a general direction as shown by the large arrow above. Such injected resin may tend to flow along one of the suspension leads (note that there are 4 suspension leads in this example), and then upon arriving at a die corner opposing the point A, the injected resin may split and equally flow in right R and left L halves (see above FIG) down opposing sides of the die. Such splitting/equalized flow may cause offsetting (*i.e.*, balanced) torque pressures being applied to the die on opposing sides of the suspension lead. Since balanced torque pressures are applied, no significant torque pressures are applied to twist the die off of the lead frame carrier. In such a situation, fixing the die 2 minimally at two separated positions (*e.g.*, at darkened locations A and B (or B and C)) may very well be sufficient to prevent shifting.

A different way of explaining the overly narrowness of the “each” limitation may alternatively explained as follows. More particularly, Applicant’s example FIG. 16 lead frame (reproduced on the previous page) appears to illustrate four suspension leads. It is respectfully submitted that any person skilled in the art in looking at Applicant’s FIG. 16 example would have immediately recognized that adhering the semiconductor chip to only three (out of four) of the suspension leads, for example, would not have had any negative effect regarding the securing of the semiconductor chip. Accordingly, again, it is respectfully submitted that Applicant’s patented limitations of “said semiconductor chip is fixed to a part of each of said suspension leads by adhesive which is located under a peripheral portion of said semiconductor chip”, are **unnecessarily restrictive in scope, and thus are an “error”**.

Since it is NOT absolutely necessary to fix (e.g., adhere) a semiconductor chip to **each suspension lead (i.e., all suspension leads)** in order to prevent shifting, again, it is respectfully submitted that Applicant’s patented claims were/are **unnecessarily and overly narrow**. In an attempt to remedy such narrowness, Applicant’s independent claim 73 and 74 substantially parallel the patented independent claims 1 and 11, respectively, but retreat from the overly-restrictive “each” language. That is, as an example, recited claim 73’s chip is “fixed to said chip mounting portion by adhesive”, and is also “fixed to a part of each at least one of said suspension leads by adhesive”. Thus, note that such claim in effect recites a semiconductor chip fixed at **two (shift-preventing) positions (i.e., a “chip mounting portion” and “at least one ...suspension lead”) separated from each other** to prevent shifting during manufacturing (e.g., during the resin encapsulation

operation). (Note: As a difference from independent claim 73, independent claim 74 recites “cracking suppression means” instead of “chip mounting portion”).)

None of the references taken alone or in combination would have disclosed or suggested Applicant’s combination of features/limitations as recited in claim 73.

That is, the chip is “fixed to said chip mounting portion by adhesive”, and is also “fixed to a part of **at least one** of said suspension leads by adhesive”, *i.e.*, at **two shift-preventing positions separated from each other** to prevent shifting during manufacturing (*e.g.*, during the resin encapsulation operation). Such arrangement and the fact that the adhesion locations are separated from each other is also advantageous in that it MINIMIZES an adhesion area used on a back of the chip, and thus water vapor reflow cracking is correspondingly MINIMIZED.

It is respectfully submitted that **the “at least one of” features/limitations “materially narrow the claim scope relative to the surrendered subject matter such that the surrendered subject matter is not entirely or substantially recaptured”** Thus, it is respectfully submitted that Applicant’s example reissue claim 73 (and claim 74, and any similar claims) does not violate recapture, and thus the recapture rejection is improper and should be withdrawn.

Regarding **claim 79** (dependent from claim 73), it is respectfully submitted that such claim should be allowed in view of its dependency on claim 73 and especially the fact that **such dependent claim explicitly incorporates the disputed recapture limitations**, *i.e.*, such claim recites: “A semiconductor device according to claim 73, wherein **said semiconductor chip is fixed to a part of each of said suspension leads by adhesive.**”

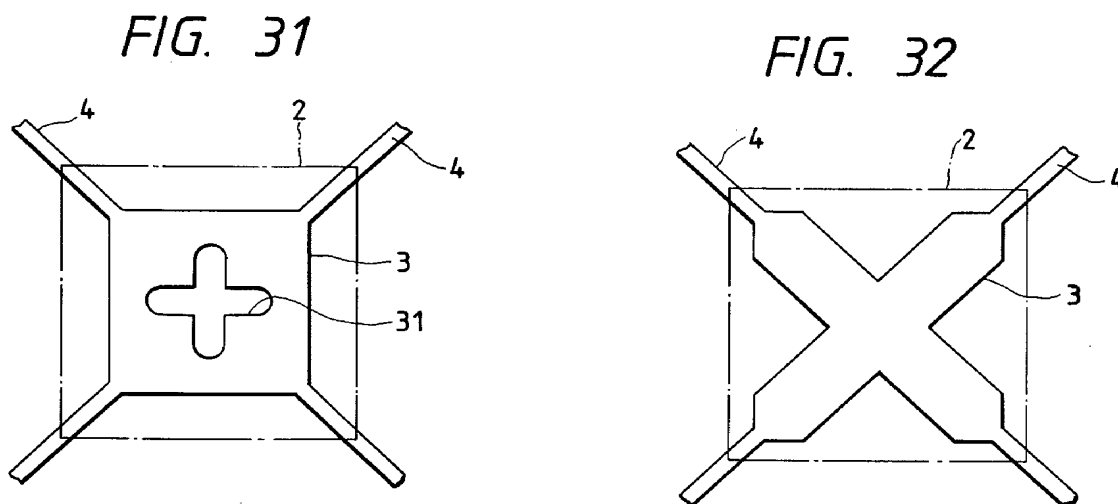
Similarly, regarding **claim 80** (dependent from claim 74), it is respectfully submitted that such claim should be allowed in view of its dependency on claim 74 and especially the fact that **such dependent claim explicitly incorporates the disputed recapture limitations**, i.e., such claim recites: “A semiconductor device according to claim 74, wherein **said semiconductor chip is fixed to a part of each of said suspension leads by adhesive.**”

Regarding **independent claim 63** (and claims 62-67 dependent therefrom), claim 63 also contains limitations equivalent to a situation where the rear surface of the semiconductor chip is fixed to the first and second suspension leads by an adhesive at at least two shift-preventing positions separated from each other. For a proper understanding of claim 63, a further discussion of patented independent claim 1 may be helpful/appropriate, and hence, such discussion is now provided herewith as follows.

More particularly, independent claim 1 recites “a leadframe having: a chip mounting portion for mounting said semiconductor chip; suspension leads formed with said chip mounting portion, a width of said chip mounting portion being wider than a width of each of said suspension leads.” That is, note that there is both a mounting portion (e.g., flag) and suspension leads. Subsequent review of such claim related to the present reissue process revealed that such claim 1 limitations may be too narrow, and does not cover **a flag-less embodiment** of Applicant's invention. More particularly, a potential infringer might (in a bid to avoid infringement) leave out the “chip mounting portion” or “flag” (as known in the art), and then attempt an argument that the claimed “chip mounting portion” covered

“flagged” chip supporting arrangements, but did not cover “flag-less” chip supporting arrangements, i.e., **the differing embodiment or invention**. Not covering a “flag-less” arrangement is another error within the present patent, which is attempted to be corrected by the present Reissue application.

Description/understanding of “flagged” verses “flag-less” may be helpful in understanding the present situation; hence, attention is now directed to the following Applicant’s FIGS. 31-32 for a “flagged” verses “flag-less” explanation:

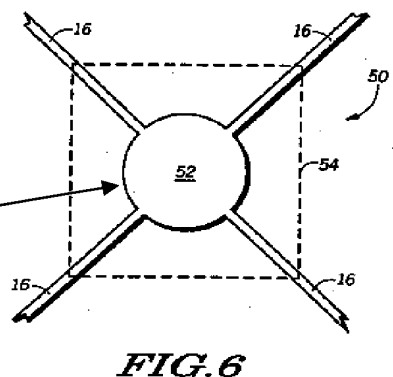
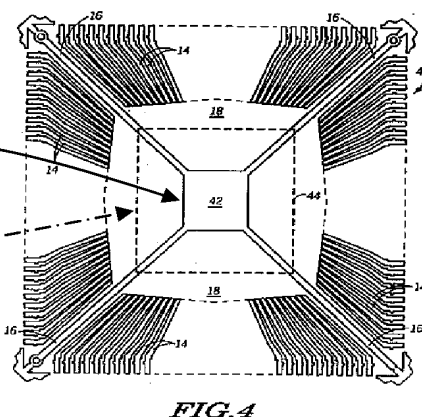


Applicant's FIGS. 31 and 32

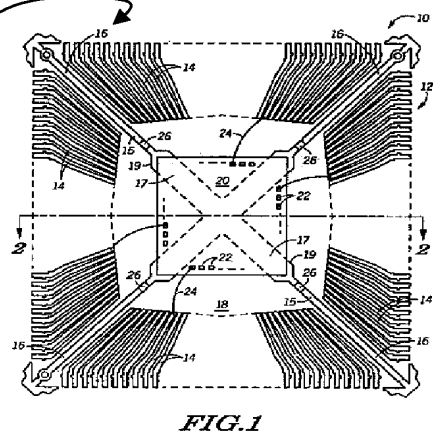
More particularly, Applicant’s FIG. 31 represents a “flagged” arrangement as is understood by persons skilled in the art (*i.e.*, note that the rectangle in FIG. 31 resembles a flag; in the art, the flag may also be circular as will be shown ahead); in contrast, Applicant’s FIG. 32 represents a “flag-less arrangement (and in this example, may be said to represent a “chip mounting cross”).

[continued next page]

“Flag” and “flag-less” terminology is known in the art, as **Djennas *et al.***’s (U.S. Patent No. 5,327,008; of record) illustrates/describes a plurality of differing die-supporting arrangements, including rectangular mini-flag, circular mini-flag AND flag-less arrangements. Djennas *et al.*’s column 6, lines 14-21, describes that Djennas *et al.*’s “FIG. 4 illustrates, in a top-down plan view, portions of a lead frame 40 having such a **mini-flag** 42. Mini-flag 42 is kept smaller in area than a semiconductor die (illustrated in phantom as line 44) to keep the total interface area between the mini-flag and a plastic encapsulation material (not illustrated) smaller than in conventional devices.” Next, Djennas *et al.*’s column 6, lines 45-48, describes that the above-reproduced “...FIG. 6 portions of a lead frame 50 (only partially illustrated) can include a **round mini-flag** 52 to support a large die (illustrated in phantom as line 54).”



Most importantly, and most relevant to the present situation, Djennas *et al.*’s column 4, lines 35-37, describes that Djennas *et al.*’s “...FIG. 1 [reproduced herewith] device 10 **does not employ a flag**. Instead, die 20 rests on tie bars 16.” Accordingly, the Djennas *et al.* FIG. 1 arrangement is a “flag-less” arrangement somewhat similar to Applicant’s FIG. 32 (re-illustrated ahead).



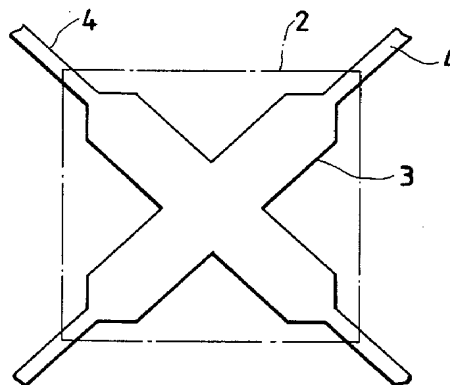
Accordingly, with the above understanding of “flagged” verses “flag-less”, Applicant’s present independent claim 63 (and claims dependent therefrom) is directed toward claiming a **differing**

embodiment (Applicant’s FIG. 32), i.e., a semiconductor device **utilizing a “flag-less” arrangement**. In terms of claim

features/limitations of interest, independent claim 63 claims: “a lead frame including: a first suspension lead (4) for supporting said semiconductor chip, extending in a first

direction; a second suspension lead (4) for supporting said semiconductor chip, extending in a second direction which is different from said first direction, said second suspension lead intersecting said first suspension lead; and ...wherein said semiconductor chip is disposed on and supported by **a flag-less said intersecting portion of said first and second suspension leads**, with said first and second suspension leads being formed with one another, wherein a width of each of said first and second suspension leads supporting said semiconductor chip at the vicinity of said intersecting portion is wider than that of each said first and second suspension leads at vicinities beyond said semiconductor chip, and widened portions of said first and second suspension leads are smaller than said semiconductor chip.”

FIG. 32



Further, independent claim 63 also has the adhesion features/limitations discussed above with respect to other ones of Applicant’s claims, i.e., “wherein said rear surface of said semiconductor chip is fixed to said first and second suspension

leads by an adhesive at at least two shift-preventing positions separated from each other”, and “wherein said rear surface of said semiconductor chip is fixed to said intersecting portion by an adhesive”. Given that the “intersecting portion” is formed by an intersection of **all (i.e., both) the suspension leads**, it is respectfully submitted that Applicant’s claimed arrangement having a “rear surface of said semiconductor chip is fixed to said intersecting portion by an adhesive”, actually is connected to **all the suspension leads**, and thus, **actually includes the disputed recapture limitations**.

To conclude, claim 63 (and claims dependent therefrom) corrects the above-discussed overly-narrow claiming error (e.g., of independent claim 1), while at the same time sufficiently distinguishing over the art of record. That is, none of the references taken alone or in combination would have disclosed or suggested Applicant’s combination of features/limitations as recited in claim 63 (or claims 64-67 dependent therefrom). For example, while Djennas *et al.*’s FIG. 1 discloses a “flag-less” arrangement, such FIG. teaches away from Applicant’s claim 63 features/limitations of: “wherein a width of each of said first and second suspension leads supporting said semiconductor chip at the vicinity of said intersecting portion is **wider** than that of each said first and second suspension leads **at vicinities beyond said semiconductor chip.**” That is, it is noted that Djennas *et al.*’s FIG. 1 arrangement has “wide” portions that extend **beyond** the Djennas *et al.* chip. [Further, it is respectfully noted that Djennas *et al.* is

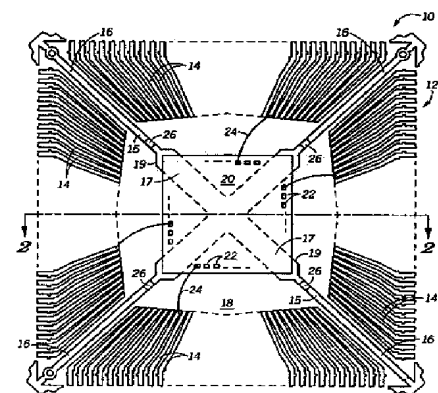


FIG.1

removable as prior art given that it has an effective filing date of 22 March 1993, whereas Applicant's foreign priority application has a filing date of 27 March 1992.]

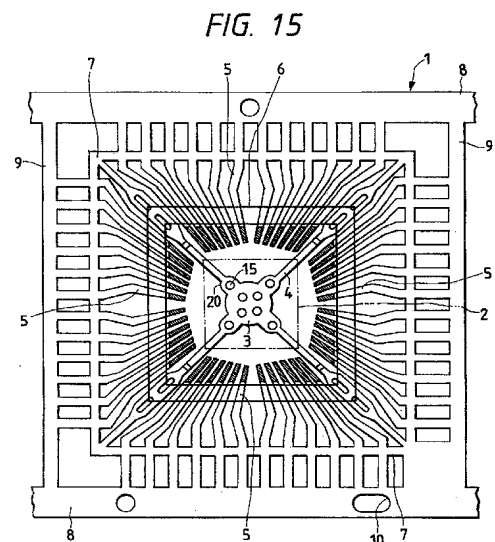
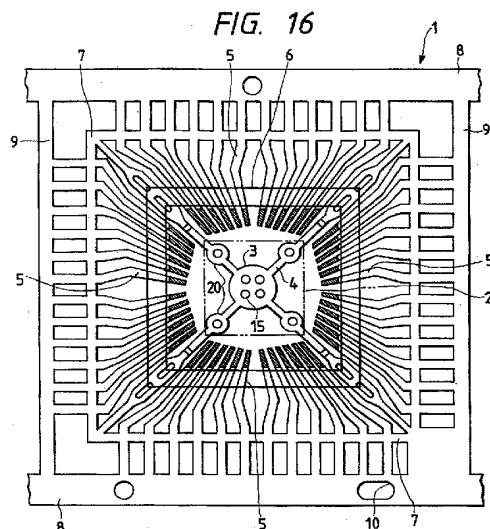
In concluding this section of arguments, it is respectfully noted that the Office Action recognizes/admits that claims 63-67 distinguish over the art of record, given that no 102/103 rejections are applied within the Office Action against such claims. In conclusion, it is respectfully submitted that such claims 63-67 correct the above-discussed overly-narrow claiming error (e.g., of independent claim 1) by claiming a differing flag-less embodiment, while at the same time actually including the disputed recapture limitations and also sufficiently distinguishing over the art of record. It is respectfully submitted that **the “flag-less” and the “at least two of” features/limitations “materially narrow the claim scope relative to the surrendered subject matter such that the surrendered subject matter is not entirely or substantially recaptured”** Thus, it is respectfully submitted that Applicant's claims 63-67 (and any similar claims) do not violate recapture, and thus the recapture rejection is improper and should be withdrawn.

Regarding **claim 77** (dependent from claim 63), it is respectfully submitted that such claim should be allowed in view of its dependency on claim 63 and especially the fact that **such dependent claim explicitly incorporates the disputed recapture limitations**, i.e., such claim recites: **“A semiconductor device according to claim 63, wherein said rear part of said semiconductor chip is fixed to a part of each of said suspension leads by adhesive.”**

Regarding **independent claim 68** (and claims 69-72 dependent therefrom), It is respectfully submitted that the present claims 63-74 **“materially narrow the claim**

scope relative to the surrendered subject matter such that the surrendered subject matter is not entirely or substantially recaptured, as follows.

Review revealed that patented claim 2's limitations may be too narrow, in containing features/limitations: wherein each of said suspension leads includes a first portion (thin/diagonal lead) and a second portion 20 (see FIG. 16) which is wider than said first portion, wherein said second portion (node 20) is separated from said chip mounting portion 3 and is positioned under said peripheral portion of said semiconductor chip 2, and wherein said semiconductor chip 2 is fixed at said second portion 20 of each of said suspension leads. Such claim 2 may be overly limiting with respect to the "separated from" and "each" limitations, as such claim may not cover Applicant's FIG. 15 embodiment which has second portions 20 not "separated from" the chip mounted portion 3, and may not cover a potentially infringing arrangement having a semiconductor chip fixed at LESS THAN "each of said suspension leads". Accordingly, the "separated from" and "each" limitations are overly-limiting errors within the present patent, which is attempted to be corrected by the present Reissue application.



Added independent claim 68 avoids such overly-narrow limitations by instead reciting: wherein said chip mounting portion 3 (Applicant's FIG. 15) has a first portion extending in a first direction (upper left node 20 to lower right node) and a second portion extending in a second direction (lower left node 20 to upper right node) which is a different direction from said first direction, said second portion intersecting said first portion, wherein a width of each of said first and second portions (nodes 20) of said chip mounting portion is wider than that of each of said plurality of suspension leads, ...wherein an intersecting portion of said first and second portions of said chip mounting portion is located at a substantially central portion of said rear surface of said semiconductor chip, wherein said both ends of each of said first and second portions of said chip mounting portion are located toward the peripheral portions of said rear surface of said semiconductor chip. Further, such claim contains the limitations "wherein said rear surface of said semiconductor chip is fixed to said chip mounting portion by an adhesive at at least two shift-preventing positions separated from each other", similar to those discussed previously with respect to other groups of Applicant's reissue claims.

Regarding rebuttal of the recapture rejection, it is respectfully submitted that such claim 68, corrects the above-discussed overly-narrow claiming error (e.g., of independent claim 2) by amending the claim to an intermediate scope (just like claim 73), while at the same time sufficiently distinguishing over the art of record. It is respectfully submitted that the "chip mounting portion 3 (Applicant's FIG. 15) has a first portion extending in a first direction (upper left node 20 to lower right node) and a second portion extending in a second direction (lower left node 20

to upper right node) which is a different direction from said first direction, said second portion intersecting said first portion, wherein **a width of each of said first and second portions (nodes 20) of said chip mounting portion is wider** than that of each of said plurality of suspension leads” and also the “**at least two of” features/limitations “materially narrow the claim scope relative to the surrendered subject matter such that the surrendered subject matter is not entirely or substantially recaptured”** Thus, it is respectfully submitted that Applicant’s claims 68-72 (and any similar claims) do not violate recapture, and thus the recapture rejection is improper and should be withdrawn.

Regarding **claim 78** (dependent from claim 68), it is respectfully submitted that such claim should be allowed in view of its dependency on claim 68 and especially the fact that **such dependent claim explicitly incorporates the disputed recapture limitations**, i.e., such claim recites: “**A semiconductor device according to claim 68, wherein said rear part of said semiconductor chip is fixed to a part of each of said suspension leads by adhesive.**”

EXAMINER INVITED TO TELEPHONE

The Examiner is herein invited to telephone the undersigned attorneys at the local Washington, D.C. area telephone number of 703/312-6600 for discussing any Examiner’s Amendments or other suggested actions for accelerating prosecution and moving the present application to allowance.

RESERVATION OF RIGHTS

It is respectfully submitted that any and all claim amendments and/or cancellations submitted within this paper and throughout prosecution of the present application are without prejudice or disclaimer. That is, any above statements, or any present amendment or cancellation of claims (all made without prejudice or disclaimer), should not be taken as an indication or admission that any objection/rejection was valid, or as a disclaimer of any scope or subject matter. Applicant respectfully reserves all rights to file subsequent related application(s) (including reissue applications) directed to any/all previously claimed limitations/features which have been subsequently amended or cancelled, or to any/all limitations/features not yet claimed, i.e., Applicant continues (indefinitely) to maintain no intention or desire to dedicate or surrender any limitations/features of subject matter of the present application to the public.

CONCLUSION

In view of the foregoing amendments and remarks, Applicant respectfully submits that the application is now in condition for allowance.

To the extent necessary, Applicant petitions for an extension of time under 37 CFR '1.136. Authorization is herein given to charge any shortage in the fees, including extension of time fees and excess claim fees, to Deposit Account No. 01-

2135 (Case No. 1374.32049R00) and please credit any excess fees to such deposit account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP

/Paul J. Skwierawski/
Paul J. Skwierawski
Registration No. 32,173

PJS/slk
(703) 312-6600